| FORM PTO-1390 (Modified) (REV 11-98)   U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE | ATTORNEY'S DOCKET NUMBER |
|---|---|
| **TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371** | **62938-013 (RSGK-3)** |
| | U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR  JC18 Rec'd PCT/PTO  23 OCT 2001 |

| INTERNATIONAL APPLICATION NO. **PCT/EP00/05624** | INTERNATIONAL FILING DATE **June 19, 2000** | PRIORITY DATE CLAIMED **August 2, 1999** |
|---|---|---|

TITLE OF INVENTION

**SYSTEM FOR THE COMMON OPERATION OF DIGITAL RADIO DEVICES ADJUSTABLE ACCORDING TO DIFFERENT WAVEFORMS**

APPLICANT(S) FOR DO/EO/US

**Peter Iselt**

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.

2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.

3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).

4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.

5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))

    a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau).

    b. ☐ has been transmitted by the International Bureau.

    c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).

6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).

7. ☒ A copy of the International Search Report (PCT/ISA/210).

8. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))

    a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).

    b. ☐ have been transmitted by the International Bureau.

    c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.

    d. ☐ have not been made and will not be made.

9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).

10. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).

11. ☒ A copy of the International Preliminary Examination Report (PCT/IPEA/409).

12. ☒ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

**Items 13 to 20 below concern document(s) or information included:**

13. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.

14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.

15. ☐ A **FIRST** preliminary amendment.

16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.

17. ☐ A substitute specification.

18. ☐ A change of power of attorney and/or address letter.

19. ☒ Certificate of Mailing by Express Mail

20. ☐ Other items or information:

PCTUS1/REV03

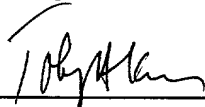| U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR **09/980915** | INTERNATIONAL APPLICATION NO. **PCT/EP00/05624** | ATTORNEY'S DOCKET NUMBER **62938-013 (RSGK-3)** |
|---|---|---|

**21.** The following fees are submitted:.

CALCULATIONS   PTO USE ONLY

**BASIC NATIONAL FEE ( 37 CFR 1.492 (a) (1) - (5)) :**

☐ Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2) paid to USPTO and International Search Report not prepared by the EPO or JPO . . . . . . . . . . . .   **$970.00**

☒ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but Internation Search Report prepared by the EPO or JPO . . . . . . . . . .   **$840.00**

☐ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO . . . . . . . . . . .   **$690.00**

☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) . . . . . . . . . . . .   **$670.00**

☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) . . . . . . . . .   **$96.00**

**ENTER APPROPRIATE BASIC FEE AMOUNT =**   **$890.00**

Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).   **$0.00**

| CLAIMS | NUMBER FILED | NUMBER EXTRA | RATE | |
|---|---|---|---|---|
| Total claims | 3  - 20 = | 0 | x   $18.00 | **$0.00** |
| Independent claims | 1  - 3 = | 0 | x   $84.00 | **$0.00** |
| Multiple Dependent Claims **(check if applicable)**. | | | ☒ | **$280.00** |

| | **TOTAL OF ABOVE CALCULATIONS** | = | **$1,170.00** |
|---|---|---|---|

Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) **(check if applicable)**. ☐   **$0.00**

**SUBTOTAL =**   **$1,170.00**

Processing fee of **$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)).   +   **$0.00**

**TOTAL NATIONAL FEE =**   **$1,170.00**

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) **(check if applicable)**. ☐   **$0.00**

**TOTAL FEES ENCLOSED =**   **$1,170.00**

| Amount to be: refunded | $ |
|---|---|
| charged | $ |

☒ A check in the amount of **$1,170.00**   to cover the above fees is enclosed.

☐ Please charge my Deposit Account No.   in the amount of   to cover the above fees.
A duplicate copy of this sheet is enclosed.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment
to Deposit Account No.   **50-1133**   A duplicate copy of this sheet is enclosed.

**NOTE:  Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.**

SEND ALL CORRESPONDENCE TO:

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NAME

**26,418**
REGISTRATION NUMBER

October 23 , 2001
DATE

## System for the joint operation of digitally operating radio appliances that can be adjusted to various waveforms

The invention relates to, and proceeds from, a system according to the preamble of the main claim.

Modern digital technology makes it possible to provide in
5  future digital radio transmitting and/or receiving
appliances that have an essentially identical hardware
construction and can be operated with different waveforms
by reading in different software. In this context, waveform
is understood as meaning the signal that appears at the
10  output of the antenna at the transition from the appliance
to the radio link and that is determined by a multiplicity
of parameters, such as frequency, type of modulation,
power, signal shape (e.g. frequency-hopping method). Such a
waveform may be determined, depending on complexity, by,
15  for example 20 to 200 individual parameters that are
mutually dependent and that are combined to form a set of
parameters and are read into the transmitting appliance
and/or receiving appliance as software so that the
appliance can then be operated with this selected waveform.
20  This modern multifunctional radio appliance principle is
described in greater detail, for example, in the paper
entitled "Multifunctional Radio Platform for Dual-Use
Applications" by Peter Iselt, AFCEA Conference, Munich,
20/21 April 1999.
25

Such multifunctional radio appliances have hitherto been
operated by the various operators with different waveforms
and are not interoperable. It would indeed be possible to
store all the conceivable or relevant waveforms in such
30  multifunctional radio appliances as complete sets of
parameters that can be retrieved by a switch-over command
so that such radio appliances can be operated with a common
waveform. However, this cannot be achieved in practice
because of the enormous memory capacity required for it and
35  the consequently unacceptable loading of the radio
appliances platform.

The object of the invention is to disclose a system with which such multifunctional radio appliances can be quickly adjusted via a centre to a predetermined common waveform so that such multifunctional radio appliances initially
5   operated in different systems can communicate with one another in the shortest time.

Proceeding from a system according to the preamble of the main claim, this object is achieved by its characterizing
10   features. An advantageous development emerges from the subclaim.

In accordance with the invention, multifunctional radio appliances that originally operate in various communication
15   systems with different waveforms can be rapidly converted via a centre to a common waveform and thus communicate with one another. For this purpose, it is not the entire set of parameters of the desired common waveform that is transmitted to the individual radio appliances from the
20   centre, but only individual addresses that are assigned to appropriate sets of subparameters that, when combined then yield the entire set of parameters for the desired waveform. This transmission of only individual addresses can take place very rapidly in the shortest time with high
25   transmission reliability. Whereas several hours may be necessary to transmit an entire set of parameters, individual addresses can be transmitted in a few seconds or minutes.

30   In accordance with a further development of the invention, it has proved expedient to divide the entire software determining a waveform into two subpackets and to store that part of the software that describes the functions and dependencies of the parameters of a set of parameters in
35   the individual radio appliances so that only that determinant part of the software that comprises the sets of parameters has to be retrieved by radio via the individual

addresses in order to operate the radio appliances with a selected waveform. Although the descriptive part of the waveform software could likewise be read out under these circumstances by radio via the appropriate addresses in a

5  waveform-specific combination, it has proved expedient to store said descriptive part of the software in the radio appliance as a permanent software component and to read out only the waveform-specific sets of subparameters via the addresses by radio.

10

The system according to the invention is suitable both for the civil and for the military communication sector. Thus, for example, actions can be carried out with participants from different alliances that are each working with

15  different technology standards. The cooperation of civil, state or military organizations in the field of catastrophe prevention or in the case of peacekeeping measures is also substantially improved by the system according to the invention.

20

The invention is explained in greater detail in the following on the basis of an exemplary embodiment with reference to a diagrammatic drawing.

25  Figure 1 shows the application of the system according to the invention in a crisis zone in which three different radio systems are being operated, for example a German radio system G that operates with a waveform WFG, a French system F that operates with a waveform WFF and a US radio

30  system US that operates according to the waveform WFUS. All of these three initially different radio systems, each comprising radio transmitters and radio receivers, are roughly the same or even identical in regard to their architecture (structure), but they can be adjusted to

35  different waveforms by inputting appropriate software via sets of parameters. In addition, a common radio connection, having, for example, a waveform WFB that is available at

least at certain times and makes possible information exchange between the three initially separate radio systems exists between these three different radio systems G, F and US.

5

If the three radio systems are now to make contact with one another, for example for tactical reasons, and this is desired, for example, by the German radio system G as managing unit, the command that said radio systems F and US
10  should also be converted to the waveform WFG is transmitted via the common radio connection WFB from the unit G acting as centre to the two other radio systems F and US.

For this purpose, the software for the waveform WFG is
15  transmitted to the participants in the radio systems F and US via the common radio connection WFB.

Since the transmission of the entire software determining the waveform WFG would take several hours, the software
20  determining the waveform WFG is divided, in accordance with Figure 2, into two subpackets, namely a descriptive part and a determinant part. The descriptive part comprises the functions and dependencies of the respective parameters of the waveform, whereas the determinant part comprises the
25  actual parameters and their values. The descriptive part is stored completely in the radio appliance and is part of the operating software for the radio appliance. The sets of parameters of the determinant part for the various possible waveforms are each divided, in accordance with Figure 3,
30  into sets of subparameters to which appropriate addresses are assigned. A set of parameters for a specific waveform, for example WFG, may comprise, for example, one hundred individual parameters or more. All these sets of parameters for the various waveforms are divided into sets of
35  subparameters TPa, TPb, TPc ...TPx and, specifically, such individual parameters are combined in each case to form sets of subparameters so that said sets of parameters can

each be used for a plurality of entire sets of parameters
of different waveforms. Each of said sets of subparameters
TPa to TPx is assigned in each case an address a, b to x.
Said sets of subparameters with the addresses assigned to
5    them are stored in all the radio appliances of the various
radio systems G, F and US and, specifically, together with
the associated descriptive part of the software in each
case.

10   If a reprogramming of the radio appliances of all three
radio systems G, F and US to the waveform WFG is now
required via the radio system G acting as centre in the
context of the above example, there are transmitted via the
radio connection WFB, in accordance with Figure 4 only the
15   addresses whose associated sets of subparameters yield,
when combined, the set of parameters that, together with
the descriptive part of the software, corresponds to the
waveform WFG. Said sets of subparameters are read out of
the associated memories of the appliances of the systems F
20   and US and the appropriate appliances are thus adjusted to
the common waveform WFG in the shortest time so that the
three radio systems G, F and US can communicate with one
another via WFG.

25   The transmission of only addresses via the connection WFB
can take place very reliably and error-free, optionally
also in encrypted form, so that faulty operations are
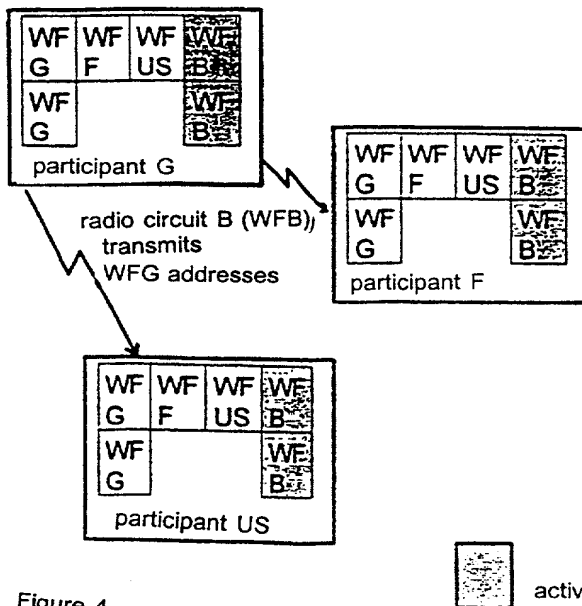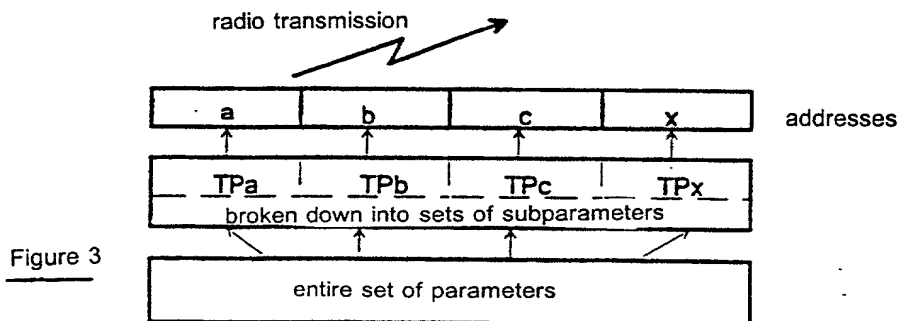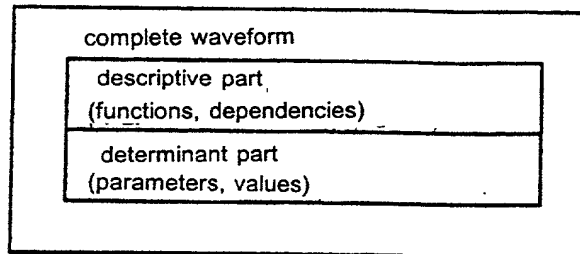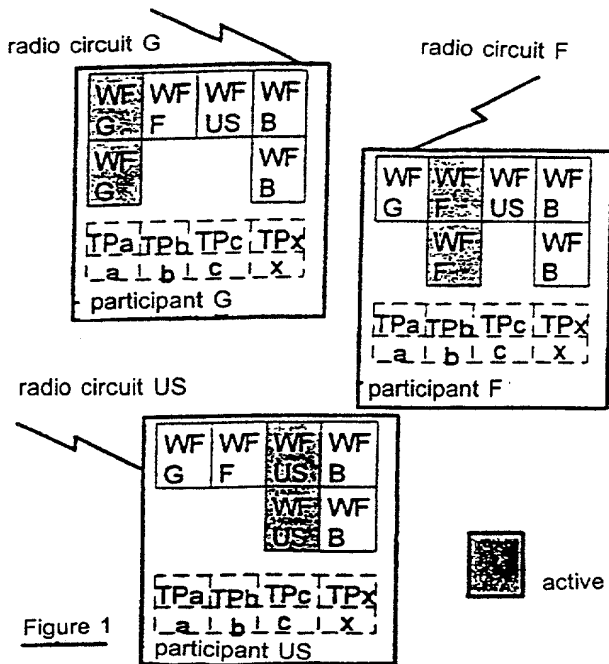avoided.

1

## New Claims

1.    System for operating digital radio appliances that can
be adjusted to various waveforms, wherein the waveform is
5    the signal occurring at the transition from the radio
appliance to the radio link at the output of the antenna
and that is determined by a multiplicity of parameters,
such as frequency, type of modulation, power, signal shape,
etc., having a common waveform set by a centre, in which
10   system the waveforms of the radio appliances can be
adjusted by sets of parameters inputted as software,
characterized in that the sets of parameters of the various
waveforms are subdivided into a plurality of sets of
subparameters (TPa to TPx) to each of which an address (a,
15   b, c to x) is assigned, the associated sets of
subparameters are each stored in the digital radio
appliances (G, F, US) to be operated jointly under said
addresses and, to adjust to a common waveform (for example,
WFG), only the addresses of the subparameters necessary for
20   the chosen waveform are transmitted by the centre (for
example, G) via a radio connection (WFB) common to all the
radio appliances and are read out therein as the total set
of parameters determining the chosen waveform.

25   2.    System according to Claim 1, characterized in that the
software determining the various waveforms is divided into
a part describing the functions and dependencies of the
parameters and a determining part comprising the actual
parameters, the describing part of the software is stored
30   in each of the radio appliances and only the determining
part of the software is subdivided into sets of
subparameters that can be retrieved through addresses by
radio so that the waveform-specific software is formed in

the radio appliances from the sets of subparameters read out via the addresses by radio together with the describing part of the software stored in the radio appliance.

5   3.   System according to Claim 1 or 2, characterized in that the division of the individual parameters into the sets of subparameters is chosen in such a way that they can each be used for a plurality of various waveform-specific entire sets of parameters.

10

radio circuit G

| WF G | WF F | WF US | WF B |
|---|---|---|---|
| WF G | | | WF B |

TPa TPb TPc TPx
a   b   c   x
participant G

radio circuit F

| WF G | WF F | WF US | WF B |
|---|---|---|---|
| | WF F | | WF B |

TPa TPb TPc TPx
a   b   c   x
participant F

radio circuit US

| WF G | WF F | WF US | WF B |
|---|---|---|---|
| | | WF US | WF B |

TPa TPb TPc TPx
a   b   c   x
participant US

Figure 1

**complete waveform**

descriptive part
(functions, dependencies)

determinant part
(parameters, values)

active

Figure 2

radio transmission

| a | b | c | x | addresses |
|---|---|---|---|---|

| TPa | TPb | TPc | TPx |
|---|---|---|---|

broken down into sets of subparameters

entire set of parameters

Figure 3

| WF G | WF F | WF US | WF B |
|---|---|---|---|
| WF G | | | WF B |

participant G

radio circuit B (WFB)
transmits
WFG addresses

| WF G | WF F | WF US | WF B |
|---|---|---|---|
| WF G | | | WF B |

participant F

| WF G | WF F | WF US | WF B |
|---|---|---|---|
| WF G | | | WF B |

participant US

active

Figure 4

Docket No.
62938-013 (RSGK-3)

# Declaration and Power of Attorney For Patent Application

## English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

**SYSTEM FOR THE COMMON OPERATION OF DIGITAL RADIO DEVICES ADJUSTABLE ACCORDING TO DIFFERENT WAVEFORMS**

the specification of which

(check one)

☐ is attached hereto.

☒ was filed on  October 23, 2001  as United States Application No. or PCT International Application Number  09/980,915

and was amended on _____

(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) or Section 365(b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)                                    Priority  Not Claimed

| 19936309.9 | Germany | August 2, 1999 | ☐ |
|---|---|---|---|
| (Number) | (Country) | (Day/Month/Year Filed) | |
| | | | ☐ |
| (Number) | (Country) | (Day/Month/Year Filed) | |
| | | | ☐ |
| (Number) | (Country) | (Day/Month/Year Filed) | |

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

| | |
|---|---|
| (Application Serial No.) | (Filing Date) |
| (Application Serial No.) | (Filing Date) |
| (Application Serial No.) | (Filing Date) |

I hereby claim the benefit under 35 U. S. C. Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. Section 112, I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C. F. R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

| PCT/EP00/05624 | June 19, 2000 | Pending |
|---|---|---|
| (Application Serial No.) | (Filing Date) | (Status)<br>(patented, pending, abandoned) |
| (Application Serial No.) | (Filing Date) | (Status)<br>(patented, pending, abandoned) |
| (Application Serial No.) | (Filing Date) | (Status)<br>(patented, pending, abandoned) |

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. *(list name and registration number)*

| | | | |
|---|---|---|---|
| Toby H. Kusmer | Reg. No. 26,418 | Scott A. Ouellette | Reg. No. 38,573 |
| Mark G. Lappin | Reg. No. 26,618 | Elizabeth E. Kim | Reg. No. 43,334 |
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